

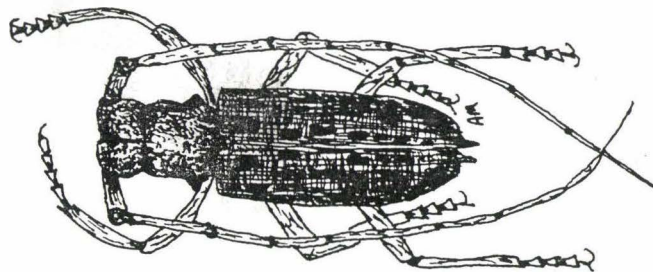
1980
ANNUAL SUMMARY
COOPERATIVE FOREST PEST ACTION PROGRAM

Prepared by:

Alan R. Miller, Forest Entomologist
S. Clark Haynes, Forest Pathologist

Cover Picture
Pinewood Nematode

During 1979, a new disease of pine trees was reported in Missouri. This new pine-wilting disease is caused by the microscopic nematode, Bursaphelenchus lignicolus. The nematode destroys epithelial cells within the tree's fluid-conducting tissues. Infected trees wilt rapidly and die. The pinewood nematode was first found in West Virginia on June 5, 1980, in a Scotch pine plantation near Charleston. Since that time the nematode has been isolated from a dying Scotch pine in Charleston and a stand of dying Scotch pine in Hampshire County. The host range for the nematode includes, but is not limited to, Scotch, red, Austrian, loblolly and white pine. However, Scotch pine appears to be most susceptible. The vector for the pathogen is thought to be a long-horned beetle. Both the Southern pine sawyer, (Monochamus titillator) and pine sawyer (Monochamus carolinensis) are suspected vectors.



Monochamus titillator

GENERAL COMMENTS

HIGHLIGHTS

The first occurrence of the pine wilt disease in West Virginia was found in Kanawha and Hampshire Counties during 1980. The wilt disease is caused by a nematode.

Numerous larvae and egg masses of the Gypsy moth were found at Mountain Mission, Jefferson County.

Scotch pine trees at North Bend State Park died from root girdling.

Aerial surveys were conducted over a seven county area to spot and delimit oak wilt disease. No oak wilt trees were found in the seven county area.

Aerial surveys were conducted in eastern and southwestern West Virginia to detect the occurrence of oak wilt. All areas checked indicate the disease is not increasing and seems to be remaining stable. Flights will be conducted in 1981 over the same area to see if the disease is spreading or remaining the same.

Aerial surveys were conducted over the eastern panhandle of West Virginia to detect defoliation from gypsy moth or other injurious insects. Some areas were noted to have noticeable defoliation.

The fall cankerworm and linden looper are starting to build up in the eastern panhandle. Defoliation is expected in 1981.

The eastern tent caterpillar was abundant this year and caused more defoliation to host and non-host trees than in the past. Populations are expected to be abundant this spring throughout the state.

A new fungus, Sebacina helvelloides, was found on white pine in southern West Virginia.

This year the first West Virginia Entomological Society was formed and two meetings were held.

The Pest Identification Laboratory logged in and answered 757 insect and disease problems in 1980. A total of 3,592 telephone calls requesting assistance or information were received during 1980.

PEST IDENTIFICATION LABORATORY

In order to give an accurate account of the specimens submitted and the telephone calls that were received in 1980 (January-December), we offer the following:

<u>Kind of Specimen</u>	<u>Number of Specimens</u>
Forest/Ornamentals Insects	364
Insects (272) Diseases (92)	
Household	143
Miscellaneous	124
Lawn/Garden	78
Insects (58) Diseases (20)	
Weed Identification	<u>48</u>
Total	757

Telephone Calls - In order of most abundant

1.**Vertebrates (including crayfish)	371	(see note at end of break-down)
2. Eastern tent caterpillar	309	
3. Scale insects	208	
4. Fleas	131	
5. Garden	78	
6. Ants	73	
7. Borers	68	
8. Cultural practices	62	
9. Carpenter bees	61	
10. Aphids	59	
11. Weeds	56	
12. Bees/Wasps	42	
13. Termites	41	
14. Spiders	38	
15. Hardwood (Misc.)	35	
16. Pesticides	34	
17. Pantry pests	<u>29</u>	
Total	*1,695	

*There were an additional 1,897 calls dealing with problems, such as: when is best time to plant; when is best time to prune; where can a certain product be bought; what is best grass seed for certain areas, etc.

The following is a breakdown of when the specimens and telephone calls were received during 1980.

PIL SPECIMENS

	<u>Insects</u>	<u>Diseases</u>	<u>Misc. unanswered</u> <u>(Justifiable)</u>	<u>Totals</u>
Jan	13	6	0	19
Feb	10	4	0	14
Mar	24	4	0	28
Apr	41	13	0	54
May	84	16	1	101
Jun	83	29	3	115
Jul	82	34	5	121
Aug	70	20	2	92
Sep	89	33	1	123
Oct	48	18	0	66
Nov	19	4	1	24
Dec	<u>10</u>	<u>1</u>	<u>0</u>	<u>11</u>
	573	182	13	768 ¹

CALLS²

Jan	71	34	0	105
Feb	61	59	0	120
Mar	115	88	0	203
Apr	264	107	0	371
May	544	182	0	726
Jun	455	168	0	623
Jul	275	140	0	415
Aug	240	114	0	354
Sep	239	81	0	320
Oct	89	83	0	172
Nov	64	20	0	84
Dec	<u>72</u>	<u>27</u>	<u>0</u>	<u>99</u>
	2489	1103	0	3592

¹Actual logged in total for 1980 is 757. Variance is due to collaboration among staff on some specimens.

²Category "Insects" and "Diseases" denotes calls handled by entomology and pathology staff, respectively.

**Note: The vertebrate pest calls included the following animals and number of calls: moles 138; bats 54; crayfish 44; snakes 42; rodents 29; birds 25; chipmunks 12; ground hog 10; and the remainder included lizards, rabbits, skunks, deer, and squirrels.

FOREST INSECTS

FALL CANKERWORM, (Alsophila pometaria). As predicted in April 1980, the fall cankerworm caused light defoliation to oaks in the Dolly Sods area of Grant County. Approximately 100 acres of hardwoods in the Sods area experienced moderate to heavy defoliation by the cankerworm. The cankerworm in past years had caused heavy defoliation to hardwoods in the Dolly Sods and Mount Storm areas of Grant County. We believe the fall cankerworm is starting to build again in the Sods area. In past years the cankerworm also caused heavy defoliation to hardwoods in the Blue Ridge area of Jefferson County. Surveys indicate the insect is building in the Blue Ridge, Shannondale area of Jefferson County and we may experience defoliation in June of 1981. The cankerworm populations are cyclic and we can expect the insect to be a problem in future years. Survey techniques will continue in 1981 to predict and delimit areas of defoliation.

EASTERN TENT CATERPILLAR, (Malacosoma americana). This insect has been on the increase since 1977, at which time it was at an all time low. We predicted in 1979 that populations would decrease in 1981 due to the cyclic nature of the insect. Natural parasites and diseases normally cause the populations to collapse after 4 or 5 years of heavy infestations. However, many other factors may or may not take place and the insect may not collapse as predicted in 1981. We will be monitoring egg masses and will make news releases at appropriate times.

The eastern tent caterpillar, after consuming all leaves of fruit trees and hawthorn at Alpha Road, Kanawha City, moved to oak and hickory trees and caused approximately 200 acres of defoliation. This is the first record in West Virginia of the caterpillar causing defoliation to non-host trees in large numbers.

FOREST TENT CATERPILLAR, (Malacosoma disstria). No problem areas were encountered during 1980 even though numbers of caterpillars were more abundant in the state. The only area known to have possibly experienced defoliation was the Blue Ridge Mountain area in Jefferson County. This area, however, was sprayed in 1979 with Dimilin to reduce gypsy moth populations and the forest tent caterpillar populations were reduced. The area around Guthrie, which was defoliated in 1979, was not defoliated in 1980. The populations seemed to collapse before the insect had reached its potential.

FALL WEBWORM, (Hyphantria cunea). This insect had been abundant in the early to mid 70's, but populations have subsided and occasional nests were observed throughout the state during 1980. This insect is cyclic and will probably start increasing in the next several years.

WALKING STICK, (Diapheromera femorata). Observations made during 1980 show this insect to be on the decline and few areas were defoliated. In 1978 these insects were responsible for the defoliation of 10,000 acres of oaks and locust in the eastern panhandle. Surveys will continue for the occurrence of this insect.

OAKLEAF TIER, (Croesia albicomana). No egg mass surveys were conducted in 1980 due to limited personnel in the division. However, aerial flights and ground observations made in 1980 showed light to negligible defoliation of oaks had occurred in Pocahontas and Greenbrier Counties. As stated in past annual summaries, populations of C. albicomana fluctuate from year to year. By making timely egg mass surveys each spring we can predict defoliation for the coming year.

SCARLET OAK SAWFLY, (Caliroa quercuscoccineae). Populations of this insect have subsided over recent years in southern West Virginia. We do not expect increased numbers of this insect for several years.

SOUTHERN PINE BEETLE, (Dendroctonus frontalis). Populations of this insect collapsed in West Virginia in 1975-76, and it is very difficult to find any specimens. The insect normally thrives in dry summer conditions. The wet summer of 1980 would certainly hinder any chances of the insect causing any damage in 1981.

LOCUST LEAF MINER, (Xenochalepus dorsalis). This leaf miner continues to cause heavy damage to black locust throughout the state with the exception of the Allegheny Mountain region. X. dorsalis has caused damage to black locust for many years and no control methods over large areas have even been tried.

VIRGINIA PINE SAWFLY, (Neodiprion pratti pratti). This insect was a serious problem on hard pines in southern West Virginia during the late 60's and early 70's. However, populations have subsided and the insect has not caused damage to hard pines for several years.

LINDEN LOOPER, (Erannis tilliaria). Observations made during the fall of 1980 leads us to believe the insect is increasing in the eastern panhandle counties of Morgan, Berkeley, and Jefferson. Surveys have not been completed and we cannot make any definite prediction for 1981. However, we feel the insect may cause defoliation to hardwoods over a large area in the Sleepy Creek Public Hunting and Fishing area of Morgan and Berkeley Counties. It is also likely that defoliation will occur in the Shannondale, Blue Ridge Mountain area of Jefferson County.

The PINE LEAF CHERMID, (Pineus pinifoliae). This insect continues to plague the stands of white pine and red spruce in the higher elevations of West Virginia. The damage to white pine can be a serious problem because the insect withdraws sap from the branches. The white pines become sickly looking and will have a yellowish color. Heavy infestations can cause the deaths of young seedling and pole size white pine. The alternate host, red spruce, experiences damage in the form of a small pineapple-shaped gall which occurs on the terminal branches. The damage, though unsightly, causes little or no damage to red spruce.

GYPSY MOTH, (Porthetria dispar)

The gypsy moth continues to move south and west. In 1980 the gypsy moth defoliated 5,105,389 acres of trees in the northeast compared to only 634,609 acres in 1979. This damage in 1980 is the most defoliation the insect has caused since its introduction back in 1869. Of the states infested with gypsy moth, New York suffered the greatest amount of defoliation with 2,449,475 acres. In order to show the states and the amounts of defoliation that have occurred since 1924, see the table at the end of this summary.

Burlap Banding for Gypsy Moth

On June 11, 1980 the second larvae of gypsy moth in West Virginia was found under a burlap band in the Shannondale Development area of Jefferson County. (The first and only larva to be found in West Virginia up to this time was on June 5, 1979). After finding the single larva at Shannondale, additional burlap bands were placed on host trees but no additional larvae were found. At the same time burlap bands were being checked at Mountain Mission about 4 miles north of Shannondale, and 26 gypsy moth larvae were found.

Burlap bands placed at other locations in Jefferson County did not reveal any additional larvae.

Gypsy Moth Trapping Program

Approximately 4,079 pheromone traps were placed in West Virginia during 1980. The trapping program for 1980 in West Virginia was divided into three categories: 1) leading edge; 2) general detection; 3) special grid. (See Map 1).

The leading edge survey encompassed the eastern panhandle and 1,214 traps were placed on a 2 Kilometer grid pattern using topographical maps. The general detection survey was a 3 Kilometer grid pattern using county maps and 1790 traps were placed.

Additionally, 490 traps were placed in state parks, forests, public hunting and fishing areas, and counties along the Ohio River. An additional 326 traps were placed on a 1x9 mile square grid in Greenbrier, Monroe, Summers, Mercer and Fayette Counties. In the special grid (500 meter) which was east of the Shenandoah River and extended from Harpers Ferry south to the Virginia state line, there were 259 traps placed. There were 330 traps placed in Virginia in this special grid.

The trapping results for 1980 are as follows:

- 1) leading edge survey - 346 male moths in 170 sites; Berkeley County, 218 males in 88 sites; Jefferson County, 58 males in 40 sites; Morgan County, 53 males in 28 sites; Mineral County, 11 males in 8 sites; Hampshire County 6 males in 6 sites.
- 2) general detection - Pocahontas County, 2 males in 2 sites.
- 3) special grid - 445 in 127 sites; the 500 meter grid had 436 males in 126 sites. Numerous traps were placed in the area of Mountain Mission and it was considered one site and 9 male moths were caught.

The total of all trapping gives us a total of 793 male moths caught in 299 sites.

Gypsy Moth Egg Mass Survey

A ground survey was conducted in November to check for egg masses laid by the female moth. Due to limited personnel, all areas of male moth catches were not checked for possible egg masses. Scouting efforts were concentrated around those areas where numerous male moths were caught and the following were found. At the Mountain Mission area, 17 old egg masses (hatched in May 1980) and 3 new egg masses were found. We expected to find egg masses here since the area had larvae present in June. Further scouting in Jefferson County revealed 3 old egg masses at Mannings about 1 mile north of the Mountain Mission area. All other areas checked were negative.

Several pheromone traps that were placed during 1980 had from 10 to 30 male moths in single traps. This high number means that we have several areas that are probably infested, but we found no evidence of egg masses or other stages of the insect except in the areas mentioned.

There were no areas defoliated by the gypsy moth this year, but in several years we can expect to see noticeable defoliation.

ELM LEAF BEETLE, (Pyrrhalta luteola) and LARGER ELM LEAF BEETLE, (Monocesta coryli). The elm leaf beetle was found causing damage to ornamental elms throughout the Kanawha Valley. The larger elm leaf beetle was extremely abundant and caused

heavy defoliation to elms throughout the state. Damage took place in late summer and little, if any, damage was done to trees.

SYCAMORE LACEBUG, (Corythucha ciliata). The sycamore lacebug caused extensive damage to sycamore throughout the state. In late August the leaves of sycamore appeared to have a bronze cast, as if fall colors were early. There are two generations per year and the one in West Virginia that caused most damage was the second generation. If the first generation is as heavy in 1981, the trees could be severely injured.

SAWFLIES

Sawflies did not cause many problems in 1980, and few specimens were submitted. An oak sawfly (Caliroa sp.) was submitted from Doddridge County where it was causing damage to a few oak trees.

Several specimens of the red-headed pine sawfly (Neodiprion lecontei) were submitted and were found causing light damage to Christmas tree plantations.

The white pine sawfly (Neodiprion pinetum) was submitted in large numbers and was found to be causing moderate damage to white pine in Christmas tree plantations and natural stands.

BAGWORMS

Bagworms were common throughout the state where they occurred on yard and ornamental plantings.

The following insects were submitted and, in some instances, caused damage to host plants:

The butternut woolly worm, Eriocampa juglandis, was found causing light damage to walnut in Summers County.

The Holly leaf miner, Phytomyza ilicicola, was abundant and seems to occur wherever the host plant grows. Approximately 12 specimens were received from the Kanawha Valley area.

The spiny-elm caterpillar, Nymphalis antiopa, also known as the mourning-cloak butterfly, was found causing moderate damage to willows in Pendleton, Summers, and Kanawha Counties. Only ornamental or small areas of willow were affected.

An oak skeletonizer, Buccalatrix ainsliella, was found causing moderate damage to scarlet oak in Kanawha County.

The Nantucket pine tip moth, Rhyacionia frustrana, was found causing moderate damage to a Christmas tree plantation of Scotch pine in Wood County.

The forest tent caterpillar, Malacosoma disstria, was submitted from Hampshire County where it caused light damage to oaks.

The yellow-necked caterpillar, Datana ministra, was submitted from Mercer County where it was feeding on fruit trees.

The hickory horned devil, Citheronia regalis, causes little, if any, damage to host plants and was submitted from Kanawha, Braxton and Mason Counties. It is of interest mostly because of the frightening appearance of the larvae.

The red turpentine beetle, Dendroctonus valens, was found causing moderate damage to a red pine plantation in Upshur County.

The hemlock looper, Lambdina fiscellaria, was found causing heavy damage to one acre of hemlocks in Harrison County.

The minosa webworm, Homodaula anisocentra, was submitted from Marion County where it caused heavy damage to a sunburst locust.

WEEVILS AND BARK BEETLES

Very few bark beetles were submitted or observed this year. We think it was partially due to the extremely wet summers we have experienced for the past two years. The white pine weevil, Pissodes strobi, was collected from Norway Spruce in Kanawha County. The pales weevil, Hylobius pales, was found causing light damage to 4 acres of Scotch pine Christmas trees in Hampshire County; light damage to 2 acres of Virginia pine in Mineral County; moderate damage to 2 acres of Douglas fir in Hampshire County; moderate damage to white pine seedlings in Clay County.

GALL INSECTS

The gall insects, even though unsightly, seldom cause death of host plants. However, many times the galls can become numerous enough to cause death of limbs and sometimes the entire plant. The horned oak gall, Callirhytis cornigera, has been found causing extensive damage the past several years to pin oaks in Kanawha City, Charleston, West Virginia. Research and studies are continuing on the problem and control recommendations will hopefully be forthcoming.

The following is a partial list of gall insects submitted to the laboratory for identification. The succulent oak gall, Andricus palustris, on pin oak in Kanawha County. The maple bladder gall, Vasates quadripedes, on silver maple in Mingo County. The wool sower gall, Callirhytis seminator, on oak in Kanawha County. The wild cherry pouch gall, Eriophyes padi, on black cherry in Greenbrier County. The gouty vein gall, Dasyneura communis, on maple in Kanawha County. The maple spindle gall, Phyllocoptes aceris-crumena, on maple in Kanawha County. The hickory gall aphid, Phylloxera caryaecaulis, on hickory in Braxton and Kanawha Counties.

BORERS

With the increased usage of wood as a fuel and log home construction, numerous specimens of borers were submitted. Some of the more common were: painted hickory borer, Megacyllene caryae, from firewood; the banded ash borer, Neoclytus caprea, from firewood and was found to be infesting logs at Ames Handle Factory in Parkersburg.

Some of the borers that were found to be causing damage to structures and trees were: powder post beetle, Lyctus sp., causing damage to a locust pole barn in Mineral County. A peach tree borer, Synanthedon pictipes, on peach in Wyoming County. The dogwood borer, Synanthedon scitula, from dogwood in Kanawha and Marshall Counties.

APHIDS

Aphids, like scale insects, cause injury by withdrawing juices from the host plant. Generally aphids were common throughout the state and seemed to be found on every type of plant. The most common aphid to be submitted was the pine bark aphid, Pineus strobi, on white pine in Kanawha, Tucker, Berkeley and Pocahontas Counties.

The Cooley spruce gall aphid, Adelges cooleyi, and the Eastern spruce gall aphid, Adelges abietis, were also submitted.

SCALE INSECTS

Scale insects were one of the more common insects submitted to the Pest Identification Laboratory. When scale insects are abundant the plant may die from such infestations. Some of the scales submitted to the laboratory were: the cottony maple scale, Pulvineria innumabilis, found on maple and boxelder in Kanawha County. (More specimens of this scale

were submitted than any other). The white peach scale, Pseudaulacapsis pentagona, found on privet, cherry and peach from Kanawha and Cabell Counties. (This insect was second in number of specimens submitted). The scurfy scale, Chionaspis furfura, on apple and flowering crab, Kanawha County. The oyster shell scale, Lepidosaphes ulmi, on maple, Kanawha and Putnam Counties. The tulip tree scale, Toumeyella liriodendri, on yellow poplar in Kanawha County. Magnolia scale, San Jose scale, and Euonymus scale from Kanawha County on magnolia, plum and euonymus. The pine tortoise scale, Toumeyella parvicornis, was found causing heavy damage (50-70%) to a 6-acre Scotch pine plantation in Hampshire County. The pine needle scale, Chionaspis pinifoliae, on white pine in Kanawha County. The oak kermes scale, Kermes sp.; oak lecanium, Lecanium quercifex, and obscure scale, Melanaspis obscura, on red oak in Kanawha County.

PATHOLOGY SECTION
HARDWOOD DISEASE PROBLEMS

DUTCH ELM DISEASE, (Ceratocystis ulmi), Incidence appeared to be at an all time high in West Virginia during 1980. Dead and dying elms were noted throughout the state. Each year it seems that more and more citizens contact us for information and assistance. In general, we only recommend sanitation and insecticide sprays. However, in the case of high value trees, we also recommend the pressure injection of fungistatic chemicals. News releases, as well as radio and television tapes, were prepared in 1980 to alert people to this problem.

ARMILLARIELLA ROOT ROT, (Armillariella mellea). Wounds provided by lawn mowers, weed whips and other gardening equipment are excellent entrance courts for root rot organisms such as Armillariella mellea. Examination of the base of declining trees frequently reveals the rizomorphs and white mycelial fan which characterize the Armillariella root rot pathogen.

FIRE BLIGHT, (Erwinia amylovora), was commonly observed during the spring of 1980 causing branch mortality on apple trees and other members of the Rosaceae. The high rate of incidence was in part related to the moist spring conditions we encountered.

ANTHRACNOSE OF HARDWOODS, (Gnomonia sp., Guignardii sp., etc.

Sycamore anthracnose, (Gnomonia platani), was not nearly as widespread or severe as it had been in past years. Only very light defoliation and shoot dieback was noted. Maple anthracnose, (Gloeosporium apocryptum), of Norway maple was identified on a number of specimens submitted to the laboratory.

PHYLLOSTICTA LEAF SPOT, (Phyllosticta minima), is a frequently observed leaf spot of red and sugar maple. The spots are .25 inches or more in diameter with brown centers and purple-brown margins. This disease causes little or no defoliation.

BULLSEYE LEAF SPOT, (Cristulariella pyramidalis), is another commonly observed leaf spot in West Virginia. Maple trees are included among the 100 or more different hosts. This disease caused light to moderate defoliation on maple trees during 1980.

ACTINOPELTE LEAF SPOT, (Actinopelte dryina), was observed on several red oaks in Kanawha County. Although conspicuous, this disease caused no problems due to premature defoliation because defoliation occurred late in the summer.

NECTRIA CANKER, (Nectria galligena), is a common disease affecting nearly all hardwood trees. Birch, walnut and sassafras are the most commonly observed species affected by this disease. Heavily cankered stands are generally found on poor sites or at high elevations.

SLIME FLUX, (Erwinia nimipressuralis), is a commonly observed problem of shade trees in West Virginia. Slime flux appears to be most prevalent on elms, but has been observed on oaks, maples, and other species.

PIN OAK BLIGHT, (Endothia gyrosa). The causal organism for pin oak blight was found at several locations in the Kanawha Valley area in 1979. Since that time the sites have been monitored to determine if the disease is spreading or causing any appreciable damage.

CEDAR-APPLE RUST, (Gymnosporangium juniperi-virginianae). Cedar-apple rust incidence was not nearly as high in 1980 as it was in 1979. Apparently the weather conditions were much drier during the spring of 1980.

CONIFER DISEASE PROBLEMS

CYTOSPORA CANKER, (Cytospora kunzei), has been observed on Norway spruce trees throughout West Virginia. Some trees have suffered extensive damage. The most striking symptoms are the browning and death of the branches, usually starting with those nearest the ground. The disease slowly progresses up the tree from branch to branch. Resin flow is commonly observed from the cankered area of dying branches.

CYLINDROCLADIUM ROOT ROT, (Cylindrocladium sp.), has been a perennial problem at the West Virginia forest tree nursery at Parsons. Numerous species of trees, both conifer and hardwood, are subject to attack by this disease. One Christmas tree grower near Beverly purchased Christmas tree seedlings (not from Parsons) during the spring and placed them in a holding bed for a year or two until they were larger for out-plantings. The grower had experienced high mortality in his holding beds. Analysis of the soil from the holding bed revealed a high population of Cylindrocladium propagules.

PINEWOOD NEMATODE, (Bursaphelenchus lignicolus), was found for the first time in West Virginia in June 1980. The nematode was extracted from stem sections of six dying Scotch pines located in a mixed stand of Scotch pine, Virginia pine, and hardwoods near Charleston. Since that time the pinewood nematode has been extracted from dying pines in Hampshire County. News releases as well as radio and television tapes were prepared to alert people to this new disease problem.

ATROPELLIS CANKER, (Atropellis tingens), continues to be a problem in a number of Scotch and Austrian Christmas tree plantations in the state. Diseased plantations are found in Raleigh, Mercer, Berkeley, and Hampshire Counties.

HEMLOCK CANKER, A dieback problem known as hemlock canker has been observed in several hemlock plantings in the state. Affected trees exhibit off-color foliage, dead and dying branches and resinosus in the canker area near ground line.

DIPLODIA TIP BLIGHT, (Diplodia pini), was reported in one Scotch pine Christmas tree plantation in Berkeley County. Diseased red and Austrian pines planted as ornamentals have been observed throughout the state. Extensive damage was noted on individual trees.

SWISS NEEDLECAST, (Phaeocryptopus gaumanni), is known to occur in at least one Douglas fir plantation in the state. Symptomatic trees appear chlorotic. Examination of the needle undersurface revealed numerous tiny black perithecia protruding from the stomata on each side of the midrib.

LOPHODERMIIUM NEEDLE CAST, (Lophodermium pinastri). A number of Christmas tree growers in the state experienced problems with lophodermium needle cast in their Scotch pine trees. These growers had failed to keep their plantations mowed and to apply the proper fungicide sprays at the proper times.

ANNOSUM ROOT ROT, (Heterobasidion annosum), has been observed in pine plantations in Tucker and Preston Counties. To date losses have not been too great in these stands.

PINE PRUNING FUNGUS, (Cenangium sp.). Surveys were continued to determine if the pine dieback problem noted in 1979 by Cenangium sp. was going to be of consequence in 1980. Fortunately, little evidence of this epiphytotic was found. Apparently disease incidence was related to the weather conditions that occurred during the previous severe winters and the suppressed conditions of the affected trees.

Sebacina helvelloides fungus was first reported in 1979 incrusting the base of hardwoods and conifers in Mercer County. In 1980 this pathogen was found in Greenbrier and Pocahontas Counties, also. Undoubtedly this fungus occurs in other counties of the state.

ABIOTIC FACTORS

SCORCH

Maple and dogwood trees in many areas of the state exhibited sun scorch symptoms after several weeks of drought-like conditions in July and August. Leaves on affected trees were brown along the margins and between the veins. Most of the affected trees were not permanently injured.

AIR POLLUTION

Oxidant damage to white pine was greatly reduced during 1980 in West Virginia. Undoubtedly the weather patterns of the summer of 1980 contributed to this decrease in severity and number of trees displaying symptoms.

SALT

After a few successive winters there have been numerous reports of de-icing salt damage to trees. Damage is most heavy to trees located near heavily traveled highways. Many of the affected trees are located over one hundred feet uphill from thoroughfares. Maples, dogwoods, white pines and hemlock are some of the trees that are more sensitive to salt.

Symptoms on deciduous plants include tip and marginal leaf burn and browning. Stem dieback has also been noted. Evergreens affected by salt damage exhibited needle bronzing and browning. In severe cases needle drop and stem dieback have been noted.

SQUIRREL DAMAGE

Sugar maple trees around the state capitol displayed dieback and decline symptoms. Investigation of the problem revealed that gray squirrels were responsible for stripping bark from the maple tree branches. This was the first time that this type of damage had been noted. The literature indicates that the squirrels purposes for bark stripping are two-fold. First of all, they feed on the sweep sap that pours from the wound area in the spring. Secondly, the stripped bark is used for lining nests.

ROOT GIRDLING

During 1980 numerous Scotch pine trees were found dead and dying at North Bend State Park. The trees were planted about

18 years ago and are now about 10 inches dbh. The trees were checked for insects and diseases at various times but none were found. Finally, the trees were removed from the soil and it was found that the trees were root girdled just below the ground. This problem could have been prevented by proper planting practices. The trees, when planted, were literally corkscrewed into the ground.

RHODODENDRON

During 1980 a large area of rhododendron plants were found dying in Webster County along the Elk River. Investigations into insects, diseases, soil acidity, and herbicide damage affecting the plants have proved negative. During the fall of 1980 soil and root samples were examined and high numbers of plant parasitic nematodes were found. No correlation with healthy plants could be established because freezing weather had set in before unaffected stands of rhododendron could be checked for nematodes. Also, an abnormal number of mole or shrew holes were noted in affected stands. Work will continue on this problem in 1981.

HERBICIDE DAMAGE

Each year numerous complaints are received concerning the misapplication of herbicides, right-of-way spraying and vandalism utilizing herbicides. Some problems are caused by a homeowner's failure to read and understand the pesticide label. In other cases people are using herbicides to damage or destroy another person's plants. Frequently acts of vandalism center around neighborhood disputes.

OAK WILT DETECTION AND CONTROL

Aerial flights were conducted in a seven-county area (Barbour, Nicholas, Pocahontas, Randolph, Tucker, Upshur and Webster) to check for the presence of oak wilt. Tucker and Webster Counties are presently listed as oak wilt free, while only a very few diseased trees have been found in the other five counties. Through conducting surveys of this nature, it is hoped that more counties will be declared oak wilt free, resulting in the increased exportation of oak veneer logs.

Only two possible infection centers were spotted by the aerial survey. Ground checks in September revealed that the suspected diseased centers were actually lightning strikes.

As in the past, foresters and landowners submitted possible oak wilt specimens to the laboratory for confirmation. Laboratory analysis is the only way to positively confirm the presence of this disease.

CHESTNUT BLIGHT PROJECT (Endothia parasitica)

The West Virginia Department of Agriculture chestnut blight project is an effort to restore the American chestnut through a selective breeding program utilizing disease resistant American chestnut. At the present, over fifty (50) resistant trees have been located in nature. Efforts are being made to propagate these trees by grafting. Grafted trees are maintained in genetic orchards at Frametown and the Clements State Tree Nursery. Different grafting techniques are being experimented with in order to determine which one will give the best results.

The WVDA has also been cooperating with researchers from West Virginia University on studies concerning hypovirulent strains of E. parasitica. Plots established in Tucker, Pocahontas and Pendleton Counties are being monitored to look for the natural spread of hypovirulent isolates within the plots.

WHITE PINE BLISTER RUST (Cronartium ribicola)

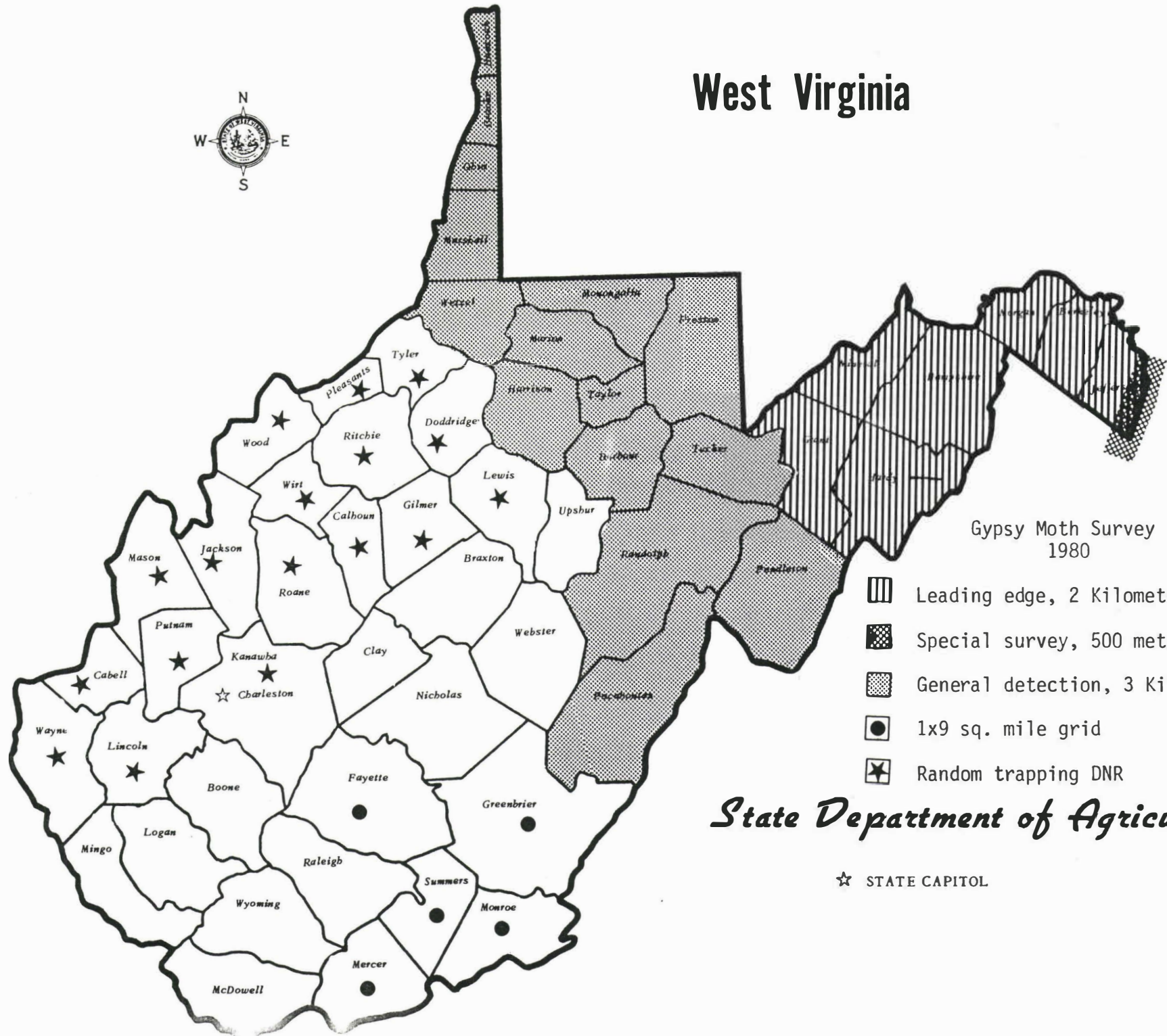
The white pine blister rust survey and control project was conducted in the native white pine zone of West Virginia. The following is a brief summary of work completed during 1980.

	<u>Surveys</u>	<u>Ribes Eradication</u>	<u>Future Work Needed</u>
<u>County</u>	<u>Acres</u>	<u>Acres</u>	<u>Plants Destroyed</u>
Raleigh	450	50	235
Summers	700	5	150
Mercer	4,225	195	676
Monroe	1,000	None	
Greenbrier	500	None	
Pocahontas	29,428	1,513	7,687
Pendleton	11,351	837	3,827
Hardy	5,212	None	
Total	52,866	2,600	12,575
			24,098

WHITE PINE ROOT DECLINE PROJECT (Verticicladiella procera)

The West Virginia Department of Agriculture and West Virginia University continued the cooperative white pine root decline project. One student at WVU completed his master's degree research on this project, and another began on this disease problem. Efforts were made to refine an agar media developed at WVU for the isolation of the pathogen from soil. The WVDA will continue to survey stands and locate new areas where this disease occurs.

West Virginia



SUMMARY OF GYPSY MOTH DEFOLIATION BY STATES
(Calendar Years Beginning in 1924)

YEAR	ME	NH	VT	MA	RI	CT	NY	PA	NJ	MD	MI	TOTALS
1924	71	591	-	163	-	-	-	-	-	-	-	825
1925	-	239	-	48,321	-	-	-	-	-	-	-	48,560
1926	1	960	5	78,193	1,663	-	-	-	-	-	-	80,822
1927	4,985	3,923	2	131,880	126	4	-	-	-	-	-	140,920
1928	5,575	119,757	3	137,121	58	-	-	-	-	-	-	262,514
1929	15,187	440,845	-	95,078	23	-	-	-	-	-	-	551,133
1930	55,174	205,125	-	27,856	66	5	-	-	-	-	-	288,226
1931	20,938	96,690	277	86,694	114	8	-	-	-	-	-	204,721
1932	42,298	43,287	1	200,387	376	46	-	-	-	-	-	286,395
1933	19,718	216,669	2	157,003	4,292	46	-	-	-	-	-	397,730
1934	60,403	285,880	25	128,237	17,750	66	-	-	-	-	-	492,361
1935	92,630	330,195	106	106,097	10,908	833	-	-	-	-	-	540,769
1936	80,944	192,114	-	152,469	3,095	-	-	-	-	-	-	428,622
1937	140,026	72,973	81	393,613	2,063	4	-	-	-	-	-	608,760
1938	120,432	34,122	416	154,348	3,297	1,339	-	-	-	-	-	313,954
1939	202,193	136,772	5,311	143,292	848	4,224	-	-	-	-	-	492,640
1940	204,041	152,797	3,160	125,586	52	-	-	-	-	-	-	485,636
1941	122,386	80,579	980	263,369	707	-	-	-	-	-	-	468,021
1942	850	6,963	49	36,715	-	-	-	-	-	-	-	44,577
1943	10	290	-	34,481	64	-	-	-	-	-	-	34,845
1944	21,221	2,346	210	225,637	640	14	75	6	-	-	-	250,149
1945	210,881	58,517	93,950	456,832	1,280	16	-	11	-	-	-	821,487
1946	203,813	183,943	15,900	217,132	1,645	486	-	-	-	-	-	622,919
1947	-	166	-	7,256	-	-	-	-	-	-	-	7,422
1948	60	21	-	32,386	-	-	-	-	-	-	-	32,467
1949	-	8	-	78,665	-	-	-	-	-	-	-	78,673
1950	2	12	-	4,979	-	375	-	-	-	-	-	5,368
1951	8,195	2,478	1,108	3,185	-	5,673	675	-	-	-	-	21,314
1952	82,715	94,975	26,985	82,372	-	6,005	-	-	-	-	-	293,052
1953	174,999	209,335	120,787	917,996	-	56,215	7,745	-	-	-	-	1,487,077
1954	170,485	154,015	24,650	118,095	-	13,848	10,355	-	-	-	-	491,448
1955	10,810	14,975	8,875	-	-	6,842	10,559	-	-	-	-	52,061
1956	7,285	9,305	12,635	3,830	-	3,458	6,645	-	-	-	-	43,158
1957	120	-	495	16	-	4,909	858	60	-	-	-	6,458
1958	-	-	-	8	-	117	-	-	-	-	-	125
	2,078,448	3,150,867	316,013	4,649,292	49,067	104,533	36,912	77	-	-	-	10,385,209

YEAR	ME	NH	VT	MA	RI	CT	NY	PA	NJ	DE	MD	MI	TOTALS
1959	1,000	4,000	1,500	382	-	5,980	1,605	-	-	-	-	-	14,467
1960	6,350	4,600	6,132	150	-	15,000	16,490	-	-	-	-	-	48,722
1961	21,340	621	11,834	3,000	-	-	30,685	-	-	-	-	-	67,480
1962	3,998	3,390	6,292	150,000	-	83,290	61,342	-	-	-	-	-	308,312
1963	1,970	8,345	12,020	87,847	-	40,140	22,600	-	-	-	-	-	172,922
1964	-	14,509	23,523	20,787	375	98,552	97,237	-	-	-	-	-	254,983
1965	190	8,451	2,903	17,232	50	86,009	148,366	-	-	-	-	-	263,201
1966	30	20	650	500	110	15,895	34,655	-	5	-	-	-	51,865
1967	825	561	2	909	150	2,731	46,160	-	1,035	-	-	-	52,373
1968	777	5,830	-	3,925	565	16,416	47,525	60	5,025	-	-	-	80,123
1969	1,450	17,160	-	6,060	313	56,881	121,610	830	51,525	-	-	-	255,829
1970	1,080	38,525	-	6,835	1,082	368,706	416,270	10,500	129,835	-	-	-	972,833
1971	820	3,250	790	18,787	8,525	655,107	479,150	598,200	180,595	-	-	-	1,945,224
1972	40	200	4,215	20,480	22,510	513,880	177,605	404,060	226,140	-	-	-	1,369,130
1973	490	30	200	43,970	35,925	333,215	248,441	856,710	254,865	-	-	-	1,773,846
1974	860	-	-	76,903	2,120	120,980	42,350	479,590	28,102	-	-	-	750,905
1975	110	-	15	17,895	435	63,411	9,275	317,880	55,430	-	-	-	464,451
1976	-	-	1,750	29,820	7,540	9,809	26,583	732,310	57,630	-	-	-	865,442
1977	2,010	320	33,435	133,081	125	-	91,313	1,296,550	39,185	-	-	-	1,596,019
1978	4,120	725	29,756	63,042	-	3,835	500,046	452,892	204,830	-	-	-	1,259,246
1979	23,180	5,980	15,411	226,260	655	7,486	162,275	8,552	193,700	10	-	100	643,609
1980	221,220	183,999	75,094	907,075	43,830	272,213	2,449,475	440,500	411,975	-	3	5	5,105,389
	2,370,308	3,451,383	541,535	6,484,232	173,377	2,974,069	5,267,970	5,598,711	1,839,877	10	3	105	28,701,580